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## Why Is a Piston Ring, Mr. Motorist?

By ERNEST A. STEPHENS

JUST as the strength of a chain is that of its weakest link, so is the piston ring representative of the measure of automobile engine operating efficiency. Of course there are other elements that exercise an influence for good or for evil, but nevertheless the fact remains that if there is anything wrong with the piston rings or their installation the engine simply can not give the adequate service for which it was designed or which its owner may reasonably expect of it.

If pistons and cylinder walls were expanded by heat at a similar rate, it is conceivable that pistons might be machined so accurately that they would fit the cylinder perfectly; but, as this is not the case, a series of piston rings is used to form with the piston what is, in effect, a movable wall for the combustion chamber—a wall that is sufficiently gas-tight to withstand a pressure which is sometimes as high as 400 pounds per square

elasticity—a loss that is often contributed to by the presence of carbon deposits in the grooves. It should be added that, should there be much carbon, the rings may stick or bind in such a way as to cause excessive friction or bad compression. Some rings are held in position by pins; but this practice of pinning has fallen into disuse to a great extent on account of the trouble involved.

In order to assure proper compression it is necessary that piston rings shall be adequately lubricated. Have you ever noticed that compression seems poor when running immediately after the engine has been idle for some time? Lack of lubrication is often the reason. Of course this is a circumstance that rectifies itself, assuming that the lubrication system is all right. Faulty lubrication during running also means ring trouble.

With the object of eliminating the various troubles to which piston rings of the ordinary type are subject, many variations in design have been introduced in the past couple of years. There are more than a score of these compound or other special rings on the market to-day, and the sketch opposite shows just a few of the methods by which it is sought to overcome the bugbear of leakage at the joints. Another object is to insure equal pressure around the surface of the cylinder walls, and to attain this end there have been many endeavors to combine concentric and eccentric members, and to produce rings that will accommodate themselves to cylinders which, because of wear, are no longer truly round. Some of these rings are made of steel—although this is not permitted to come in contact with the cylinder walls, but acts as a carrier which presses cast-iron sections against the walls.

After all, it is the ordinary type of piston ring that is in general use, and it is therefore the ring with whose faults we should be familiar. The others are refinements for which greater efficiency is claimed, and time and use will show whether all these claims can be substantiated, as some undoubtedly are.

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I have been told that by adding moth balls to gasoline I shall get additional power and more miles to the gallon. Is this true?  
P. C. M., North Dakota.

Probably not, although theoretically the naphthalene might be considered as a power producer. Anyway, you would run the risk of plugging up the supply line in cold weather, owing to crystallizing of the naphthalene. No damage to the cylinders need be anticipated, as similar substances have been used for fuel on many occasions, notably in France in 1902.

What, if any, are the advantages of using wire wheels? Are there any disadvantages?  
S. R., Florida.

Wire wheels are, or should be, stronger and lighter than wood wheels. They are also more resilient, and it is stated that their use means greater tire-mileage. The only known disadvantage (and it is not a great one) is that they are not so easily cleaned.

Please tell me why kerosene can not be used successfully instead of gasoline? Can I alter my carburetor to use it?  
L. de M., Illinois.

The principal reason is that kerosene does not vaporize as readily as gasoline. It needs a lot of heat to get anything like good results, and in cold weather it's a very difficult matter to start the engine. Kerosene has been used successfully with gasoline, the latter being employed in starting and used until the engine is hot. You can not do much with your present carburetor and kerosene; we advise you to keep to gasoline.



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